

The listing of claims will replace all prior versions, and listings, of claims in the application:

### **LISTING OF CLAIMS**

**Claims 1** (previously amended): A phosphor blend comprising at least two phosphors selected from the group consisting of (a)  $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+},\text{Mn}^{2+}$ ; (b)  $(\text{Ca},\text{Sr},\text{Ba})_a(\text{PO}_4)_3(\text{F},\text{Cl},\text{OH}):\text{Eu}^{2+},\text{Mn}^{2+}$  wherein a is in a range from about 4.5 to and including 5; (c)  $3.5\text{MgO}\cdot 0.5\text{MgF}_2\cdot \text{GeO}_2:\text{Mn}^{4+}$ ; (d)  $(\text{Sr},\text{Ba},\text{Ca})_5(\text{PO}_4)_3(\text{Cl},\text{OH}):\text{Eu}^{2+}$ ; (e) an europium-activated aluminate phosphor selected from the group consisting of  $(\text{Ba},\text{Ca},\text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}$ ,  $(\text{Ba},\text{Ca},\text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$ , and  $(\text{Ba},\text{Ca},\text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$ ; and (f) an europium and manganese co-activated aluminate phosphor selected from the group consisting of  $(\text{Ba},\text{Ca},\text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+},\text{Mn}^{2+}$ ,  $(\text{Ba},\text{Ca},\text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+},\text{Mn}^{2+}$ , and  $(\text{Ba},\text{Ca},\text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+},\text{Mn}^{2+}$ ; said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

**Claim 2** (previously amended): The phosphor blend of claim 1, wherein said phosphor blend absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

**Claim 3** (previously amended): The phosphor blend of claim 1, wherein a is in a range from about 4.7 to and including 5.

**Claim 4** (original): The phosphor blend of claim 1, wherein said emitted light is white light.

**Claim 5** (original): The phosphor blend of claim 4, wherein said white light has color coordinates substantially on a black body locus of a CIE chromaticity diagram.

**Claim 6** (previously amended): A phosphor blend comprising a mixture of  $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+},\text{Mn}^{2+}$  and at least one phosphor that is selected from the group consisting of (a)  $(\text{Ca},\text{Sr},\text{Ba})_a(\text{PO}_4)_3(\text{F},\text{Cl},\text{OH}):\text{Eu}^{2+},\text{Mn}^{2+}$  wherein a is in a range from about 4.5 to and including 5 ; (b)  $3.5\text{MgO}\cdot 0.5\text{MgF}_2\cdot \text{GeO}_2:\text{Mn}^{4+}$ ; (c)  $(\text{Sr},\text{Ba},\text{Ca})_5(\text{PO}_4)_3(\text{Cl},\text{OH}):\text{Eu}^{2+}$ ; (d) an europium activated aluminate phosphor selected from the group consisting of

(Ba,Ca,Sr)<sub>2</sub>MgAl<sub>16</sub>O<sub>27</sub>:Eu<sup>2+</sup>, (Ba,Ca,Sr)MgAl<sub>10</sub>O<sub>17</sub>:Eu<sup>2+</sup>, and (Ba,Ca,Sr)Mg<sub>3</sub>Al<sub>14</sub>O<sub>25</sub>:Eu<sup>2+</sup>; and (e) an europium and manganese co-activated aluminate phosphor selected from the group consisting of (Ba,Ca,Sr)<sub>2</sub>MgAl<sub>16</sub>O<sub>27</sub>:Eu<sup>2+</sup>,Mn<sup>2+</sup>, (Ba,Ca,Sr)MgAl<sub>10</sub>O<sub>17</sub>:Eu<sup>2+</sup>,Mn<sup>2+</sup>, and (Ba,Ca,Sr)Mg<sub>3</sub>Al<sub>14</sub>O<sub>25</sub>:Eu<sup>2+</sup>,Mn<sup>2+</sup>; said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

**Claim 7** (previously amended): The phosphor blend of claim 6, wherein said phosphor blend absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

**Claim 8** (previously amended): The phosphor blend of claim 5, wherein a is in a range from about 4.7 to and including 5.

**Claim 9** (previously amended): A phosphor blend comprising a mixture of (Ca,Sr,Ba)<sub>a</sub>(PO<sub>4</sub>)<sub>3</sub>(F,Cl,OH):Eu<sup>2+</sup>,Mn<sup>2+</sup> wherein a is in a range from about 4.5 to and including 5 and at least one phosphor that is selected from the group consisting of (a) Sr<sub>2</sub>P<sub>2</sub>O<sub>7</sub>:Eu<sup>2+</sup>,Mn<sup>2+</sup>; (b) 3.5MgO·0.5MgF<sub>2</sub>·GeO<sub>2</sub>:Mn<sup>4+</sup>; (c) Sr<sub>4</sub>Al<sub>14</sub>O<sub>25</sub>:Eu<sup>2+</sup>; (d) (Sr,Ba,Ca)<sub>5</sub>(PO<sub>4</sub>)<sub>3</sub>(Cl,OH):Eu<sup>2+</sup>; (e) an europium activated aluminate phosphor selected from the group consisting of (Ba,Ca,Sr)<sub>2</sub>MgAl<sub>16</sub>O<sub>27</sub>:Eu<sup>2+</sup>, (Ba,Ca,Sr)MgAl<sub>10</sub>O<sub>17</sub>:Eu<sup>2+</sup>, and (Ba,Ca,Sr)Mg<sub>3</sub>Al<sub>14</sub>O<sub>25</sub>:Eu<sup>2+</sup>; and (f) an europium and manganese co-activated aluminate phosphor selected from the group consisting of (Ba,Ca,Sr)<sub>2</sub>MgAl<sub>16</sub>O<sub>27</sub>:Eu<sup>2+</sup>,Mn<sup>2+</sup>, (Ba,Ca,Sr)MgAl<sub>10</sub>O<sub>17</sub>:Eu<sup>2+</sup>,Mn<sup>2+</sup>, and (Ba,Ca,Sr)Mg<sub>3</sub>Al<sub>14</sub>O<sub>25</sub>:Eu<sup>2+</sup>,Mn<sup>2+</sup>; said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

**Claim 10** (previously amended): The phosphor blend of claim 9, wherein said phosphor blend absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

**Claim 11** (previously amended): The phosphor blend of claim 9, wherein a is in a range from about 4.7 to and including 5.

**Claim 12** (previously amended): A phosphor blend comprising a mixture of  $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+},\text{Mn}^{2+}$  and  $(\text{Ca},\text{Sr},\text{Ba})_5(\text{PO}_4)_3(\text{F},\text{Cl},\text{OH}):\text{Eu}^{2+},\text{Mn}^{2+}$ ; wherein a is in a range from about 4.5 to and including 5, and said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

**Claim 13** (previously amended): The phosphor blend of claim 12, wherein said phosphor blend absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

**Claim 14** (previously amended): The phosphor blend of claim 12, wherein a is in a range from about 4.7 to and including 5.

**Claim 15** (previously amended): A phosphor blend comprising a mixture of phosphors having formulas  $3.5\text{MgO}\cdot 0.5\text{MgF}_2\cdot \text{GeO}_2:\text{Mn}^{4+}$ ;  $\text{Sr}_4\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$ ; and an europium and manganese co-invented aluminate phosphors selected from the group consisting of  $(\text{Ba},\text{Ca},\text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+},\text{Mn}^{2+}$ ,  $(\text{Ba},\text{Ca},\text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+},\text{Mn}^{2+}$ ,  $(\text{Ba},\text{Ca},\text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+},\text{Mn}^{2+}$ ; said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

**Claim 16** (previously amended): The phosphor blend of claim 15, wherein said phosphor blend absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

**Claims 17-18** (canceled)

**Claim 19** (previously amended): A phosphor blend comprising a mixture of phosphors having a formula of  $3.5\text{MgO}\cdot 0.5\text{MgF}_2\cdot \text{GeO}_2:\text{Mn}^{4+}$ ;  $(\text{Sr},\text{Ba},\text{Ca})_5(\text{PO}_4)_3(\text{Cl},\text{OH}):\text{Eu}^{2+}$ ; and an europium activated aluminate phosphor selected from the group consisting of  $(\text{Ba},\text{Ca},\text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}$ ,  $(\text{Ba},\text{Ca},\text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$ ,  $\text{Mn}^{2+}$ , and  $(\text{Ba},\text{Ca},\text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+},\text{Mn}^{2+}$ ; said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

**Claim 20** (previously amended): The phosphor blend of claim 19, wherein said phosphor blend absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

**Claim 21** (previously amended): A light source comprising: at least one LED that is capable of emitting electromagnetic radiation having wavelengths in a range from near UV to blue; least one phosphor material selected from the group consisting of (a)  $(\text{Ca}, \text{Sr}, \text{Ba})_a(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH})\text{:Eu}^{2+}, \text{Mn}^{2+}$  wherein  $a$  is in a range from about 4.5 to and including 5; (b)  $3.5\text{MgO} \cdot 0.5\text{MgF}_2 \cdot \text{GeO}_2\text{:Mn}^{4+}$ ; (c)  $(\text{Sr}, \text{Ba}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{OH})\text{:Eu}^{2+}$ ; (d) an europium-activated aluminate phosphor selected from the group consisting of  $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27}\text{:Eu}^{2+}$ ,  $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17}\text{:Eu}^{2+}$ , and  $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}\text{:Eu}^{2+}$ ; and (e) an europium and manganese co-activated aluminate phosphor selected from the group consisting of  $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27}\text{:Eu}^{2+}, \text{Mn}^{2+}$ , and  $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}\text{:Eu}^{2+}, \text{Mn}^{2+}$ ; and (f) mixtures thereof; said phosphor material being capable of absorbing said electromagnetic radiation emitted by said LED and emitting light having wavelengths in the visible spectrum.

**Claim 22** (original): The light source of claim 21, wherein said LED emits electromagnetic radiation in a wavelength from about 315 nm to about 480 nm.

**Claim 23** (previously amended): The light source of claim 21, wherein  $a$  is from about 4.7 to and including 5.

**Claim 24** (previously amended): The light source of claim 15, wherein said LED preferably emits electromagnetic radiation from about 350 nm to about 410 nm.

**Claim 25** (previously amended): A light source comprising: at least one LED that is capable of emitting electromagnetic radiation having wavelengths in a range from near UV to blue; and a phosphor consisting of a material selected from the group consisting of  $\text{Sr}_2\text{P}_2\text{O}_7\text{:Eu}^{2+}, \text{Mn}^{2+}$ ,  $(\text{Ca}, \text{Sr}, \text{Ba})_a(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH})\text{Eu}^{2+}, \text{Mn}^{2+}$  wherein  $a$  is in a range from about 4.5 to and including 5, and mixtures thereof; said phosphor being capable of absorbing said electromagnetic radiation emitted by said LED and emitting light having wavelengths in the visible spectrum.

**Claim 26** (previously amended): The light source of claim 25 wherein  $a$  is from about 4.7 to and including 5.

**Claim 27** (previously amended): A light source comprising: at least one LED that is capable of emitting electromagnetic radiation having wavelengths in a range from near UV to blue; and a phosphor consisting of a first material selected from the group consisting of  $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+}$ ,  $\text{Mn}^{2+}$  and  $(\text{Ca},\text{Sr},\text{Ba})_a(\text{PO}_4)_3(\text{F},\text{Cl},\text{OH})\text{Eu}^{2+}$ ,  $\text{Mn}^{2+}$  wherein  $a$  is in a range from about 4.5 to and including 5; and a second material selected from the group consisting of (a)  $3.5\text{MgO } 0.5\text{MgF}_2\text{GeO}_2:\text{Mn}^{4+}$ ; (b) an europium-activated aluminate phosphor selected from the group consisting of  $(\text{Ba},\text{Ca},\text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}$ ,  $\text{Mn}^{2+}$ ,  $(\text{Ba},\text{Ca},\text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$ ,  $\text{Mn}^{2+}$ , and  $(\text{Ba},\text{Ca},\text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$ ,  $\text{Mn}^{2+}$ ; and (c) an europium and manganese co-activated aluminate phosphor selected from the group consisting of  $(\text{Ba},\text{Ca},\text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}$ ,  $\text{Mn}^{2+}$ ,  $(\text{Ba},\text{Ca},\text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$ ,  $\text{Mn}^{2+}$ , and  $(\text{Ba},\text{Ca},\text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$ ,  $\text{Mn}^{2+}$ .

**Claim 28** (previously added): The phosphor blend of claim 1, wherein  $a$  is in a range from about 4.9 to and including 5.

**Claim 29** (previously added): The phosphor blend of claim 5, wherein  $a$  is in a range from about 4.9 to and including 5.

**Claim 30** (previously added): The phosphor blend of claim 9, wherein  $a$  is in a range from about 4.9 to and including 5.

**Claim 31** (previously added): The phosphor blend of claim 12, wherein  $a$  is in a range from about 4.9 to and including 5.

**Claim 32** (previously added): The light source of claim 21, wherein  $a$  is from about 4.9 to and including 5.

**Claim 33** (previously added): The light source of claim 25, wherein  $a$  is from about 4.9 to and including 5.